

## **Dissenting Views on the Report to Congress, "Toward a New National Science Policy"**

We commend our colleague the Honorable Vernon Ehlers for the significant effort to bring forward a comprehensive science policy report. The report offers a guide and framework for continued focus on the importance of science as well as an outline for future congressional scientific discussions and deliberations regarding policy and funding options. The report, however, lacks significant input on issues of major concern. We offer dissenting views for inclusion as a means to strengthen the report.

We find the Report needs to address four critical areas:

- 1) the role of underrepresented populations in the fields of science and technology,
- 2) social and behavioral sciences,
- 3) K-12 science and math education, and
- 4) the challenges of environmental quality.

### **The Role of Underrepresented Populations**

This Report makes only passing mention of the role of underrepresented populations (African-Americans, Hispanics, and People with Disabilities) in the fields of science and technology. It is essential that any science policy document address the need to create a policy to include these populations in our Nation's science and technology efforts.

If we do not, we will have a technology divide between Americans. For example, presently, the percentage of white households owning computers is 40.8% as compared to 19.3 % of African- American households and 19.4 % of Hispanic households. In addition, 39% of black students in public schools have access to computers at school, compared with 56% of white students.

Solving this problem is crucial because from 1996 to 2006, employment in science and engineering occupations is expected to increase at more than three times the rate for all occupations. At the same time, some projections state that by the year 2000, two-thirds of the new entrants into the American workforce will be made up of minorities and women. But, the number of Hispanic and African-American first-year graduate enrollment in science and engineering fields dropped by 16.2 and 19.3 percent respectively from 1996 to 1997. Taken together, these trends spell disaster as a whole generation of young people may be left behind unable to ride the technological wave. To begin this process, we recommend:

- 1) the development of programs to involve underrepresented communities in the fields of science and technology. For example, the National Science Foundation's Urban Systemic and Rural Systemic Initiative programs focus on a specialized math and science curricula at the high school level. Programs which are based on variables such as household income will improve the education of our youth. High schools with a majority of low income students have been shown to lack adequate science, engineering, math and technology curricula.
- 2) the involvement of underrepresented populations in the scientific community by partnership programs between Historically Black Colleges and Universities (HBCUs), Hispanic Serving Institutions (HSIs), large research institutions and corporate industries. Cooperative Research and Development Agreements (CRADAs) is an excellent opportunity for collaborations, provide role models, and a support system for smaller institutions.

However, recent NSF data from (1993-1994) shows that research institutions received

approximately \$12.7 billion from ten federal agencies. Ten billion dollars of this amount was allocated to the top 100 research universities, but not one HBCU received a substantiated amount. Only \$140 million went to the top 81 HBCU producers of African American students, while Johns Hopkins alone received \$701 million. More needs to be done to develop CRADAs with minority institutions of higher education if we are to see more minorities in the fields of science and technology.

### **The Inclusion of Social and Behavioral Sciences**

The Report is deficient because it does not include social and behavioral sciences. Social science is an important field that has helped this nation grow in important areas, such as public health and education. The behavioral sciences are equally important. Psychologists and psychiatrists have a unique understanding of the human mind that cannot be captured by biologists or medical doctors. These disciplines are uniquely situated so that they can help identify and solve problems that come about through the interactions between people, something that the "hard sciences" cannot address adequately.

The omission of these important disciplines is only exacerbated by the fact that the Report recommends that those sciences be used actively in the legislative and administrative processes. Repeatedly, in decisions like *McClesky V. Kemp*, 481 U.S. 279 (1987), the Supreme Court has rejected the use of statistics and the social sciences to prove the elements of a case, and indicated that it is Congress who should more appropriately use that information when making decisions for society. Although we are not in agreement with the decision of that case *in toto*, the lesson of the case is clear -- social science and the use of statistics must be used to remedy problems that affect large segments of society. It is more than ironic that through current times, the most compelling use of a social science study by the judiciary created perhaps the most monumental decision of our time, *Brown V. Board of Education*.

Given the importance of social and behavioral sciences in understanding human behavior and relations and in making critical social and political decisions, we recommend:

- 1) any further activities with regard to the updating of science policy recognize the need to include social and behavioral sciences.

### **The Importance of K-12 Science and Math Education**

The treatment of K-12 science and mathematics education in the Report shows good intentions, but lacks the depth of recommendations needed to bring about change. Although the TIMMS results are unarguably disappointing, we cannot be surprised given the lack of investment we have made in this area. Also, the Report states that "Ongoing professional development for existing teachers is also important." Yet on September 18, 1998, the House voted (212 - 218) to kill the Eisenhower Professional Development Program. In H.R. 3248, the Dollars to the Classroom Act, the Eisenhower Program was designed to train teachers to become more effective in math and science instruction.

K-12 education is perhaps the most important component of our scientific enterprise. We all want schools to 'encourage the natural curiosity of children and convey the excitement of science', but how can educators be expected to do this when they are not given the class resources, or the training, to foster that type of exchange. Therefore, the question left unanswered in the Report, is "How much will a quality K-12 science and technology education cost, and are we prepared to make that investment?" We recommend:

- 1) in the 106<sup>th</sup> Congress, the Science Committee should hold hearings on the allocation of

monies for a quality science education, teacher training, and technology in the classroom. Also, initiatives in which science could be relayed to underrepresented communities should be explored.

### The Necessity of Environmental Quality

Research on the environment as an area of science needs greater research attention. In order for human societies to become healthful, productive and sustain a relationship with the natural world, the public, private and governmental sectors must include environmental consideration as an integral part of decision making, including decisions on where to invest our research dollars. Science should include the environment as a distinct area of research focused on solutions to the problems that face our nation and the world, such as, the inclusion of epidemiological and health sciences.

The National Research Council, in each of its major operations in the National Academy of Sciences, the National Academy of Engineering, and Institute of Medicine has identified the environmental sciences as an area outside of risk analysis and regulatory decision making. It is widely accepted that human activities have a great impact on the environment and there is general acknowledgement that scientific and engineering research play a vital role in understanding and protecting the environment. Research has noted the importance of the environment to health, as well as the economic, social and aesthetic harm that stems from poor environmental practices.

For example, air quality research is an area of critical need. We must develop better understandings of the dynamics of global climate change and trends in tropospheric ozone which are critical to our quality of life. Also, the generation and disposal of waste from industrial and agricultural processes need much greater attention by researchers; and the management and mismanagement of ecosystems, endangered species, fisheries, and other living systems are constant problems that threaten our survival and likewise demand scientific attention.

We recommend:

- 1) the development of a systematic, interagency initiative on environmental research at the federal level, including a strong emphasis on the social and behavioral sciences, that can move our Nation toward sustainable resource planning and utilization,
- 2) research regarding the relationship between environmental quality, public health, and social costs of environmental policy decisions, and
- 3) the development of an environmental education initiative that better informs the public about environmental issues.

In offering these views, it is our hope that any future Congressional conversations include the aforementioned in an effort to create a National Science Policy which is sound, diverse, and inclusive.

  


  
